

IX. *Note on the Manubrium of the Ninth Sternite in the Male Earwig.* By MALCOLM BURR, D.Sc., F.E.S.

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PLATES XXX—XXXIII.

AN organ which has been almost totally neglected by writers on the Dermaptera, whether taxonomists or anatomists, is the Manubrium of the ninth sternite of the male. The majority of authors, indeed, appear to be totally ignorant of its existence. Verhoeff, it is true, noticed its great length in the *Psalinae*, writing of this group, in 1901, that "Subgenitalplatte des ♂ vorne mit recht langen endoskelettalem Fortsatz, der jederseits einen Verdickungsfaden zeigt." Ten years later, Zacher figures the incomplete manubrium of *Anisolabis verhoeffi* (1911, fig. W¹), but without comment. Jordan and Burr describe it with a figure, in the case of *Arixenia jacobsoni* (fig. 14, p. 403). Jordan refers to it as a special sclerite, it being distinct from the ninth sternite in that group, and suggests that its function may be that of a support to the penis. This might be the case in *Arixenia*, where the organ in question is short, transverse and so structurally strong, but its great length and extreme narrowness in the *Psalidae* deprive it of all rigidity.

If we dissect out the ninth sternite of a male earwig, we find on the basal, inner margin, an extension of the chitin, consisting of a fine hyaline membrane supported by a thread-like indurated chitinous frame. This is the manubrium. In most groups it is short, rarely much longer than broad, but it is extremely prominent in the *Psalinae*. The accompanying photographs, for which I am indebted to the Rev. F. D. Morice, illustrate the various forms of this organ in sundry groups; unfortunately, the material has not always been of the best, the organ itself being sometimes torn and distorted, or sometimes obscured by bunches of torn muscular fibre which remain adhering to the plate; still, the illustrations illustrate the range of variety in form and design of this organ in most of the subfamilies of the Dermaptera. This diversity encourages us in the hope that from the manubrium we shall be able to draw some very valuable characters.

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As will be seen from the following observations, we have already been able to make good use of the manubrium in two cases—that is, the definition of the *Psalinae*, and the separation therefrom of "*Psalis*" *femoralis*.

In the *Diplatyinae*, I am able to show the manubrium in three species, all Indian; in none of these is it prominent, only a slight extension of the basal edge of the plate being discernible.

Of the *Pygidicraninae*, we have the case of *Kalocrania picta*, Guér. Here it is a trifle longer than broad, rounded at the tip, with the sides parallel.

In the *Pyragrinae*, we are able to figure it in four species, representing two genera; i. e. *Pyragra dohrni* and *P. fuscata*, Serv., and *Pyragropsis paraguayensis* and *P. thoracica*, Serv. In all of these it is rather transverse and broadly rounded, approaching the semicircular.

In the *Echinosomatinae*, the figure of *E. sumatranum* shows it to be very similar in that group.

Passing from the *Pygidicranidae* to the *Labiduridae* we find it triangular in *Esphalmenus camposi*, Bor., but whether this is of specific or of generic importance remains to be seen; the figure of this species shows prominently the characteristic apical incision, with lobes, of the transverse ninth segment of that species.

In the *Labidurinae*, we find an almost rectangular manubrium in the case of *Labidura riparia*; it will be interesting to see if this form occurs also in the allied *Nala* and *Forcipula*.

We now come to the *Psalinae*, and here we meet with a startling change. The eight species figured show the very prominent, disproportionately long, manubrium, which I now take as the distinguishing character of this group. There is a general similarity of structure in each case, but the actual length of the manubrium varies, especially in proportion to the length of the sternite, which is in itself a very useful feature. This is seen in *Euborellia penicillata*, Bor., from South India, where it is not twice as long as the sternite, nor indeed scarcely more than $1\frac{1}{2}$ times as long, but in *Eulabis saramaccensis*, Zacher, it is nearly three times as long.

In *Psalis americana*, Beauv., and *Carcinophora robusta*, Scudd. (= *Psalis gogatina*, Klug), it is at the base about a third as wide as the sternite, but rapidly narrowed; the sides then meet, and diverge only at the apex to form a

small dilatation : the total length is about twice that of the sternite.

In *Psalis pulchra*, Rehn, the sternite is about as broad as long, the posterior margin with a shallow, rounded emargination, and a pair of tufts of small bristles : the sides of the manubrium are remote at the base, but less so than in the preceding species, rapidly converge, and gently dilate towards the apex. The total length is about double that of the sternite. In *Labidurodes robustus*, Dubr., it is shorter than the sternite, narrow at the base, and dilated at the apex.

In *Euborellia greeni*, Burr (in a specimen from the Sheraroy Hills), it is three times as long as the sternite, the sides almost contiguous at the base, and feebly dilated at the apex.

In *E. stâli*, Dohrn, the sternite is about as broad as long, the manubrium, nearly three times as long, almost contiguous at the base.

In *Gonolabis picea*, Bor., the sternite is transverse, and the manubrium, as in *E. stâli*, is about three times as long as the plate itself. In *Anisolabis infelix*, Burr, it is about twice as long, and in *Euborellia moesta*, Gén  , it is a little less than twice as long.

When we come to *Psalis femoralis*, Dohrn, we find quite a different type of manubrium, which is relatively broad, the length being about double the width, and the tip itself broadly rounded ; it is obviously not a *Psalidine* manubrium, approaching more nearly to that of *Labidura* ; but the male genital armature is also quite characteristic, and at once different from that of the *Psalinae* and of the *Labidurinae* ; this will be described and figured in another paper, where I shall propose the erection, not only of a new genus, but even of a new subfamily, for the little brown Indian and Singalese earwig that is known as "*Psalis*" *femoralis*.

In the Eudermaptera, we do not find very much variety ; the species illustrated, representing seven genera, belonging to the *Labiinae*, *Chelisochinae*, *Anechurinae* and *Forficulinae* ; they are rather broad and short, gently narrowed at the tip ; only in *Marava wallacei*, Dohrn, do we find different form ; but this is a single specimen, in not very good condition.

EXPLANATION OF PLATES XXX—XXXIII.

PLATE XXX.

- FIG. 1. *Kalocrania picta*, Guér.
 2. *Pyragra saussurei*, Dohrn
 3. *Propyragra paraguayensis*, Bor.
 4. „ *thoracica*, Serv.
 5. *Echinosoma sumatranum*, Haan
 6. *Pyragra dohrni*, Sauss.

PLATE XXXI.

7. *Diplatys rufescens*, Kirby
 8. „ „
 9. „ *gladiator*, Burr
 10. „ *bormansi*, Burr
 11. „ „
 12. *Esphalmenus camposi*, Bor.
 13. „ „
 14. *Labidura riparia*, Pall.
 15. “*Psalis*” *femoralis*, Dohrn

PLATE XXXII.

16. *Psalis dohrni*, Kirby
 17. *Euborellia penicillata*, Bor.
 18. „ *stali*, Dohrn
 19. *Anisolabis owenii*, Burr
 20. *Euborellia penicillata*, Bor.
 21. *Psalis pulchra*, Rehn
 22. *Euborellia moesta*, Géné
 23. *Eulabis saramaccensis*, Zacher.

PLATE XXXIII.

24. *Chaetospania thoracica*, Dohrn
 25. *Spongorostox assimilasis*, Borm.
 26. *Marava wallacei*, Dohrn
 27. *Mesochelidura peringueyi*, Borm.
 28. *Kosmetor*, sp. n.
 29. *Chelisoche morio*, Fabr.
 30. *Apterygida cavalli*, Bor.
 31. *Forficula auricularia*, L.